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[54] **ELECTROPHORETIC DISPLAY PANEL WITH ARC DRIVEN INDIVIDUAL PIXELS**

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[52] **U.S. Cl.** **345/107**; 313/484; 359/296

[58] **Field of Search** ..... 340/787, 788, 763, 771; 313/483, 484, 358, 585, ; 359/293, 294, 295, 296, 297; 345/107, 48, 60, 49

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[57] **ABSTRACT**

An electrophoretic display includes a laminated triple pane construction with an electrophoretic fluid-containing envelope formed between the first and second panes and an ionizable gas-containing envelope between the second and third panes. A transparent reference electrode coats the first pane internal to the fluid envelope. A matrix of discrete pixels are disposed upon the second pane within the fluid envelope. Each pixel has a probe extending therefrom through the second pane and into the gas envelope. A plurality of row electrodes are disposed upon the second pane in the gas envelope in close proximity to corresponding rows of probes. A plurality of column electrodes disposed upon the third pane within the gas envelope perpendicular to the row lines establishes an addressable X–Y matrix. By impressing a sufficient voltage differential at selected intersections of the matrix, a local ionization of gas biases a proximate probe to the ionization potential. The probe potential is shared by the corresponding pixel, setting up an electrostatic field relative to the reference electrode for controlling the movement of pigment within the fluid. A capacitive effect is realized upon removal of ionization potential whereupon the gas deionizes leaving the pixel and probe to discharge slowly through the dielectric fluid.

17 Claims, 3 Drawing Sheets